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46. Почему на лунном "небе" появились тени?

22-27 minutes

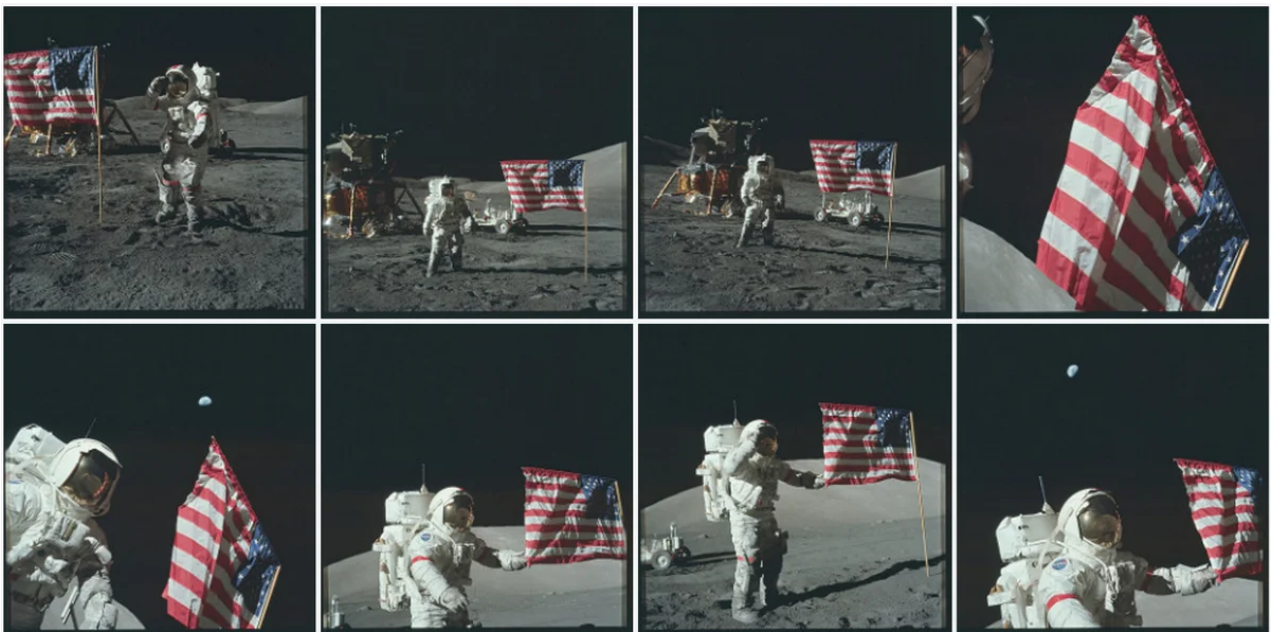
There is such a lunar image, which for many years has been suspicious of its reliability - an astronaut on the moon near a flag.

Astronaut allegedly on the moon, the Apollo 17 mission

According to NASA legend, the image shows astronaut Harrison Schmidt (Apollo 17 mission, 1972) on the Moon; next to it is the American flag, and above the flag is the image of the Earth. First of all, the professionally verified composition of the image is surprising - the astronaut, the American flag and the image of the Earth are inscribed in an exact triangle. It should be noted that the second astronaut, who took this picture, took pictures "blindly", he did not have the possibility of sighting: the **camera was hanging on a bracket on his chest** and

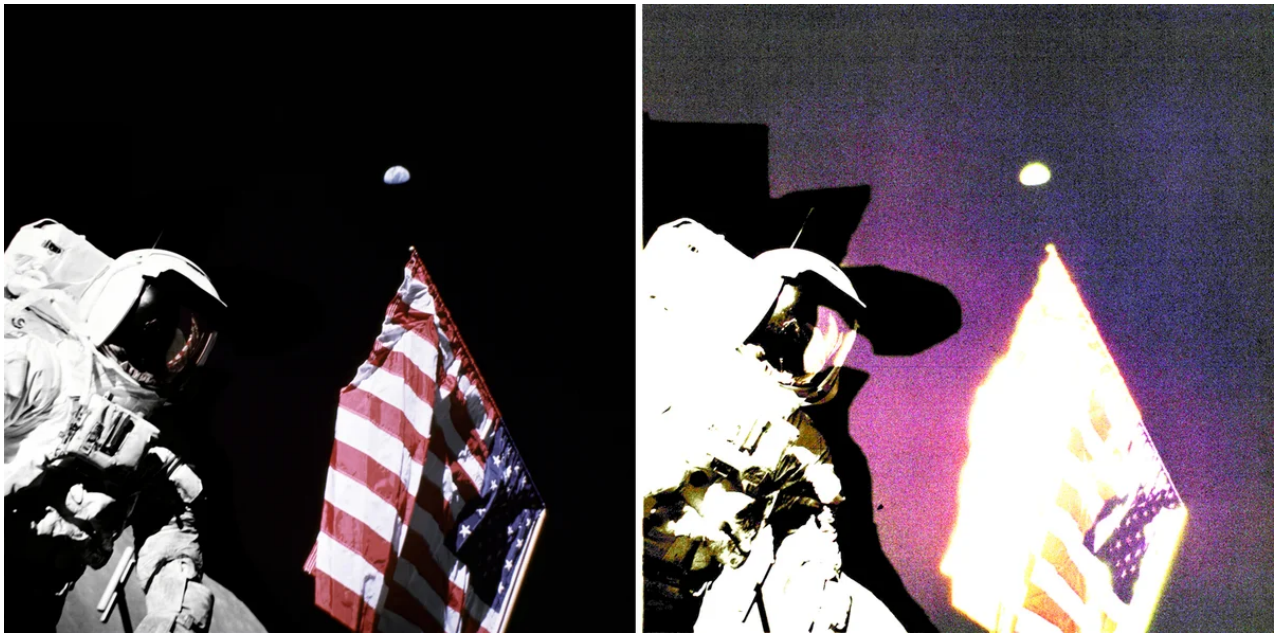
there was no way to look through the viewfinder while wearing a helmet. Having looked at the neighboring photographs, where the slope of the mountain is clearly visible, we can conclude that the photographer was not standing vertically, but deviated from the vertical by about 35-40 ° (the mountain line is "overwhelmed"). I wonder how he did it? In addition, to take such a picture, and this is clearly the lowest point, the astronaut-photographer would have to lie on his back, with a life support backpack on the lunar soil, which is generally not permissible for safety reasons.

Of course, from these doubts it does not yet follow that this is a fake, a fake picture. Defenders of NASA will provide counterarguments proving that such a compositional match is quite possible to make with several attempts, and will immediately give a link to less successful takes made from about the same place.



A series of sequential stills with a flag.

"And the bottom point of the survey," NASA defenders will add, "can be obtained by throwing your back back and bending to the side." No one has checked whether it is possible to tilt the back so much as to get an angle from below and not fall in a spacesuit - after all, a backpack hangs behind, the weight of which is 2/3 of the astronaut's weight. Therefore, all the arguments "for" and "against" stop at a speculative stage - no one has tried to repeat such an angle in the studio with a camera and actors. However, the suspicion of inaccuracy is caused not by a very low shooting point and not by a professionally verified composition of the picture, but a completely different fact. If you increase the "Brightness" of this image or raise the "Level" of GRAY (not black) in the graphics editor, strange angular shadows will appear around the astronaut's figure. You can see for yourself if you download the topmost picture to your computer, and raise the brightness in Photoshop.



When the brightness of the image is increased, artifacts in the form of "shadows" appear in the blackness of space.

"Where can shadows appear in the sky?" - skeptics ask. - "Maybe behind the astronaut there is not space, but a backdrop in the pavilion, and the astronaut's shadow falls on this backdrop?" For the second decade, the "strangeness" of this photograph has been discussed on the Internet. This highlighted image was cited, for example, by Doctor of Physics and Mathematics Alexander Popov in his 2009 book "Americans on the Moon. Great Breakthrough or Space Scam?" with the caption: "someone named" geologist-astronaut Garrison Schmidt "poses in a dubious scene" on the moon "". Such photographs, according to the author, raise doubts about their "lunar" origin.
The author of the video on U-Tuba under the nickname "noncertainty" came to the conclusion that this is not one,VIDEO: "Apollo Faked Photo?"

Discussions have been going on for many years. The fact is that the photo was taken not just from the Internet, but from the official NASA website, from the section "The Greatest Photos of NASA" (GReat Images in NASA), the identifier of this photo is also indicated there (AS17-134-20384).

According to skeptics, this artifact - angular "shadows" - testifies to the falsification of "lunar" photographs.

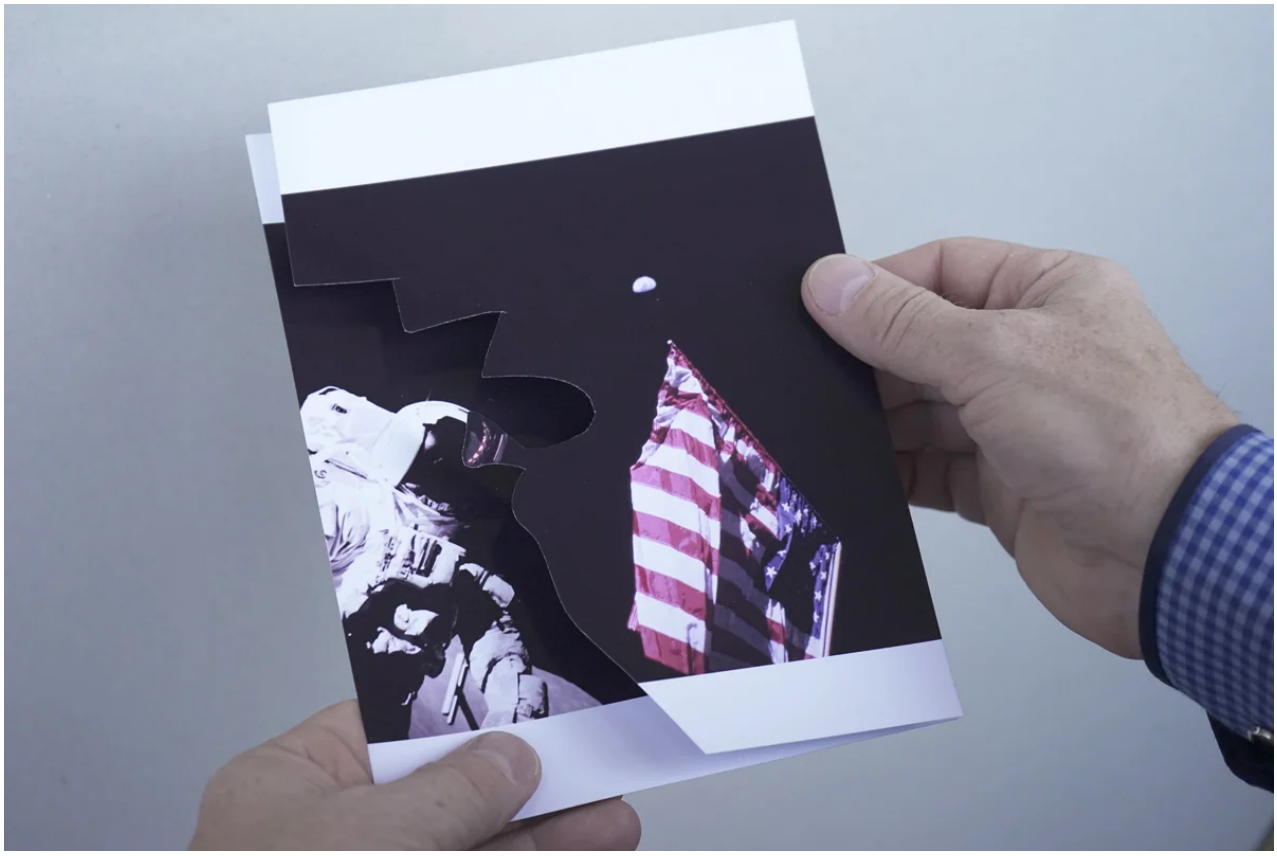
Since there were a large number of such statements on various Internet resources, the pro-American Wikipedia could not fail to cite this argument of skeptics in the "Lunar Conspiracy" section - a photo with normal brightness and highlighting (with gamma correction):

The pro-American Wikipedia had to argue with skeptics.

However, the curators of Wikipedia tried in every possible way to neutralize the arguments of the skeptics, citing the fact that in the photograph we see only a "digital retouch" of the image. Wikipedia page with the theme "Lunar conspiracy", where this photo appears No one, however, did not understand what this mysterious phrase "digital retouching" means, and why this retouch has a zigzag shape, but the blow of skeptics was, as it were, parried.

At one time, I tried to include in the text of the discussion of this photo the phrase that this photo is a collage of two pictures, but all my attempts were immediately stopped by the curators of Wikipedia: literally after an hour or two, such phrases were deleted from the Wikipedia page irrevocably. So what do we actually see in the photograph? Digital retouching? Shadow? Or two superimposed photos? Since we know the way in which this image was obtained, we will immediately say that the angular zigzag black emissions behind the astronaut's back are not shadows. And to characterize this artifact, we will use the term "blackness", but we will not use the word "shadow". Let's reveal the secret right away - you need to look for evidence of deception where the flag is located.

We have no complaints about the zigzag "blackness" behind the astronaut's figure - this is the natural blackness of an unexposed area of photographic material. But the background behind the flag when highlighted is unnatural - it is purple-violet. The background is black behind the astronaut, purple behind the flag. Can you guess what this means? This means that the astronaut and the flag are shot against different backgrounds! And, therefore, the photograph itself is a collage of two images superimposed on one another. What is taken as the contours of the shadow is the border of the mask that separates one image from another.
Let's follow step by step how this picture was taken. An astronaut was shot separately against a black background - this is the first image. The second image is a separate American flag and its reflection in a spherical mirror. In addition, in the second image there is also a "circle" of the earth above the flag.



Combining two photos.

The second image is cropped on one side so that the reflection in the spherical mirror could be superimposed on the astronaut's helmet and not obscure other significant details of the first image. It turns out a curved cut line. In addition, there is a sharp angle that abuts against the helmet.

This acute angle is a register mark, an indicator of control over the alignment accuracy of two shots. This angle should touch the helmet with one point - then this will be a sign of the optimal connection of the two images.

When the brightness is increased, the border along which the second photo was clipped is visible. Thus, this "moon" photograph is a COLLAGE - a combination of two photographs taken at different times. If you increase the brightness of the image in a graphics editor, then the background around the flag turns purple-violet instead of black, and we see a BORDER separating one image from another.

Why does the background behind the flag turn purple? And the fact is that behind the flag is not the blackness of space and not even the black velvet of the pavilion backdrop. There, in the background, is ... a screen made of tiny glass beads, a reflective screen, such a material is called "scotchlight".
We have already written more than once that front projection was one of the ways to falsify lunar images. For

example, there was an article"The most famous lunar photograph from the Apollo 15 mission was taken in the pavilion using the front projection method . " The shooting took place in a large pavilion, where a slide with a view of a lunar mountain was projected onto the background, on a 32-meter wide screen, and from the same direction (where the light from the slide projector came from) photo and film were filmed.

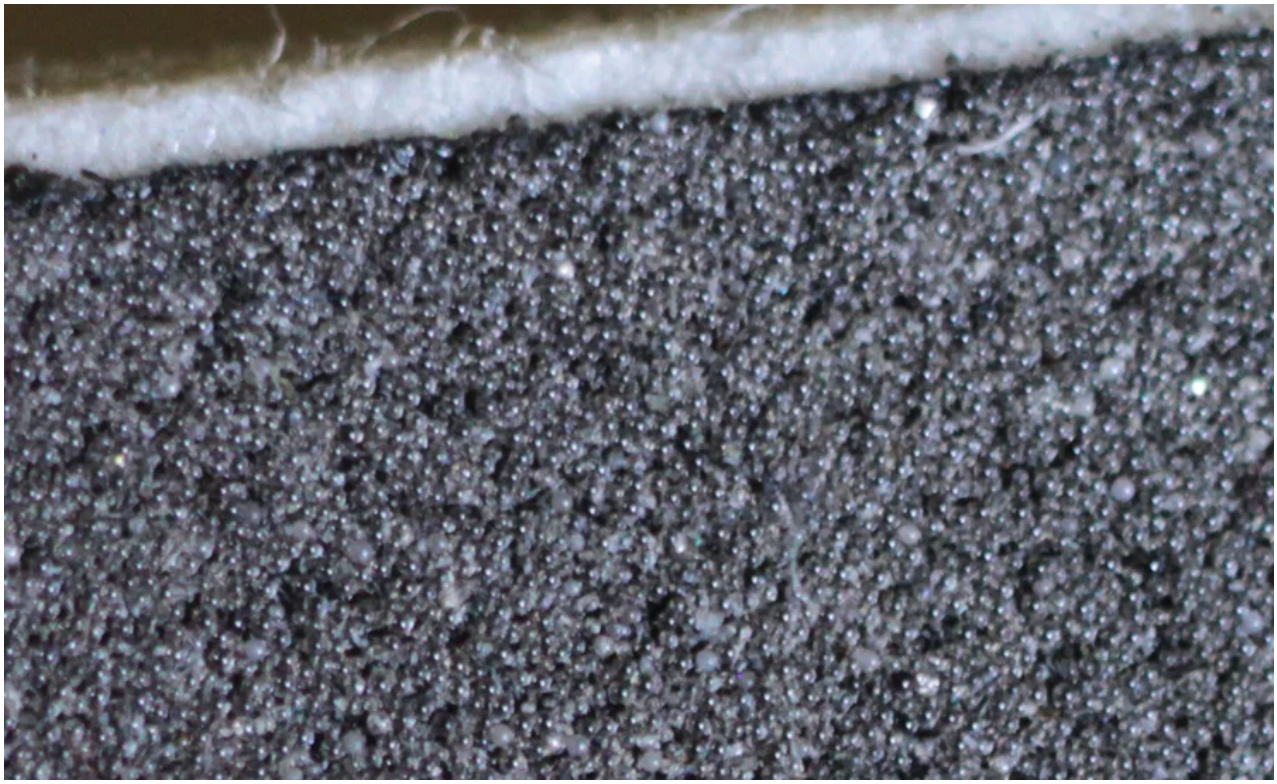
To get an image of an astronaut in front of a lunar mountain, it is not at all necessary to send a person to the moon. It is easy to make such a picture by the method of combined shooting, the main thing is to project the image of the "lunar" mountain onto the screen, and put an actor depicting an astronaut in front of the screen. For front projection, a screen made of a special reflective material, scotchlight, is used. This "luminous" material is used in road signs and stripes on workwear.

Reflective fabric in diffused light is gray (left frame), in directional light it becomes much brighter than a white shirt (right frame).

White screen does not apply for two reasons. First, it scatters light EQUALLY IN ALL SIDES, so that for all viewers in the cinema, looking at the screen from different angles, the screen appears to be the same brightness. But such diffuse scattering of light in all directions leads to the fact that the brightness on the screen is not very high. Even in modern cinemas, the brightness on the screen is such that if you want to shoot from a cinema screen, for example, with a digital camera, then you have to set the sensitivity to about 2 thousand ISO. And at the end of the 60s of the twentieth century, when Kodak was making color film with a maximum light sensitivity of only 160 units, it was possible to count only on a screen 5-6 meters wide. On the larger screen, the illumination turned out to be so low that there was simply not enough light sensitivity for reshooting.

The second reason why a white screen is not used in combined filming is due to the fact that the actor in front of the screen must be brightly illuminated, like on a sunny day.

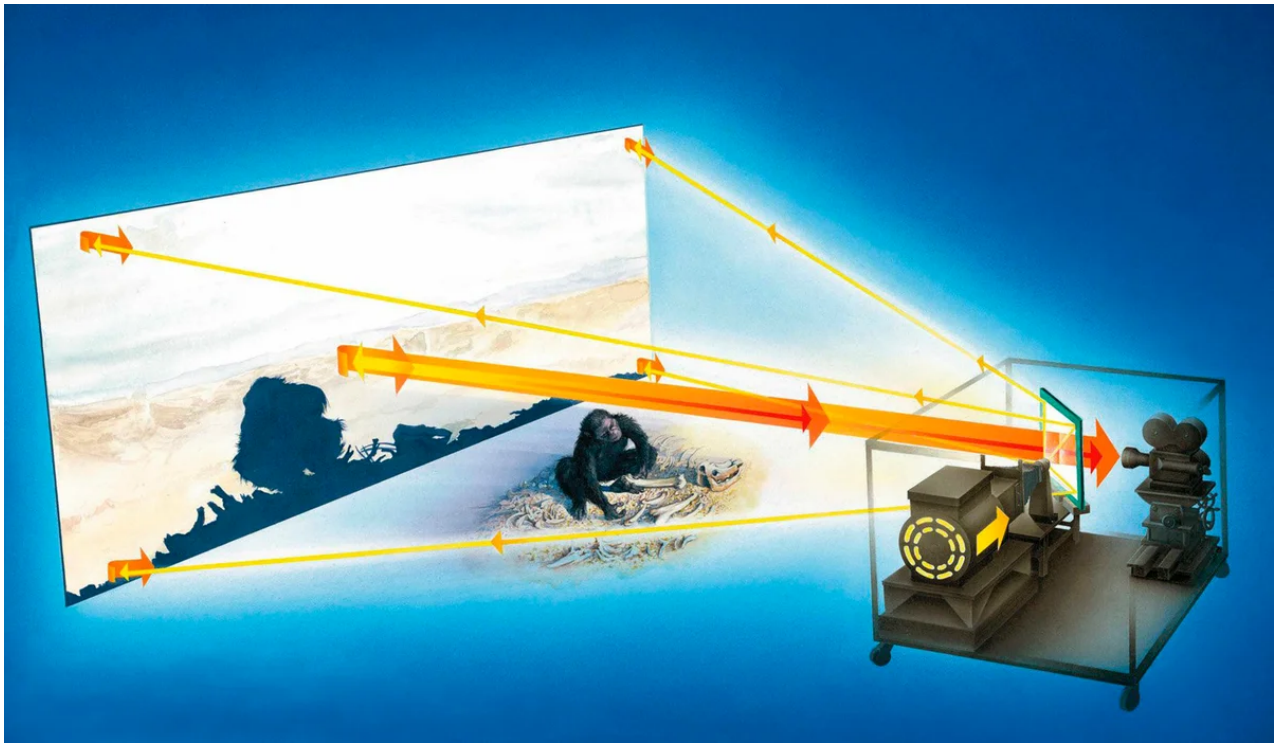
You understand perfectly well that if even a weak light is turned on in the hall during the screening of a film, the entire screen will light up, the image on the screen will fade, but for a "moon" frame you need to highlight the space in front of the screen very brightly. That is why a very tricky screen made of reflective material, made of scotchlight, is used. This reflective material consists of tiny glass beads.



Retroreflective material for macro photography.

If you draw a line one inch (2.54 cm) long across the material, you can count up to 300 balls on this line. They are about the size of a print dot in a printer at 300 dpi.

Each glass ball acts like a tiny mirror and, according to the laws of refraction and reflection, 95% of the reflected light returns to where the light came from. If you aim a slide projector at such a screen, then all the reflected light will return to the projector lens. If you stand at this point, then the brightness of the scotchlight screen will be about 100 times higher than that of a white screen. The white screen scatters the light in all directions, and the scotchlight gathers the light into one point. It is at this point that the camera is placed. In other words, the slide projector projecting the image of the mountain onto the movie screen and the shooting camera itself must be exactly at the same point. But in this case, the camera will block the light from the projector. The solution was found quite simple - a translucent mirror was placed in the path of light from the slide projector at an angle of 45 °, and a filming camera was placed behind the mirror. And the light that returns from the screen hits the lens of the shooting camera exactly. The picture below is an example of how Stanley Kubrick practiced front projection in 2001. A Space Odyssey. An African mountain landscape was projected onto a reflective screen, with an actor depicting a monkey in front of the screen.



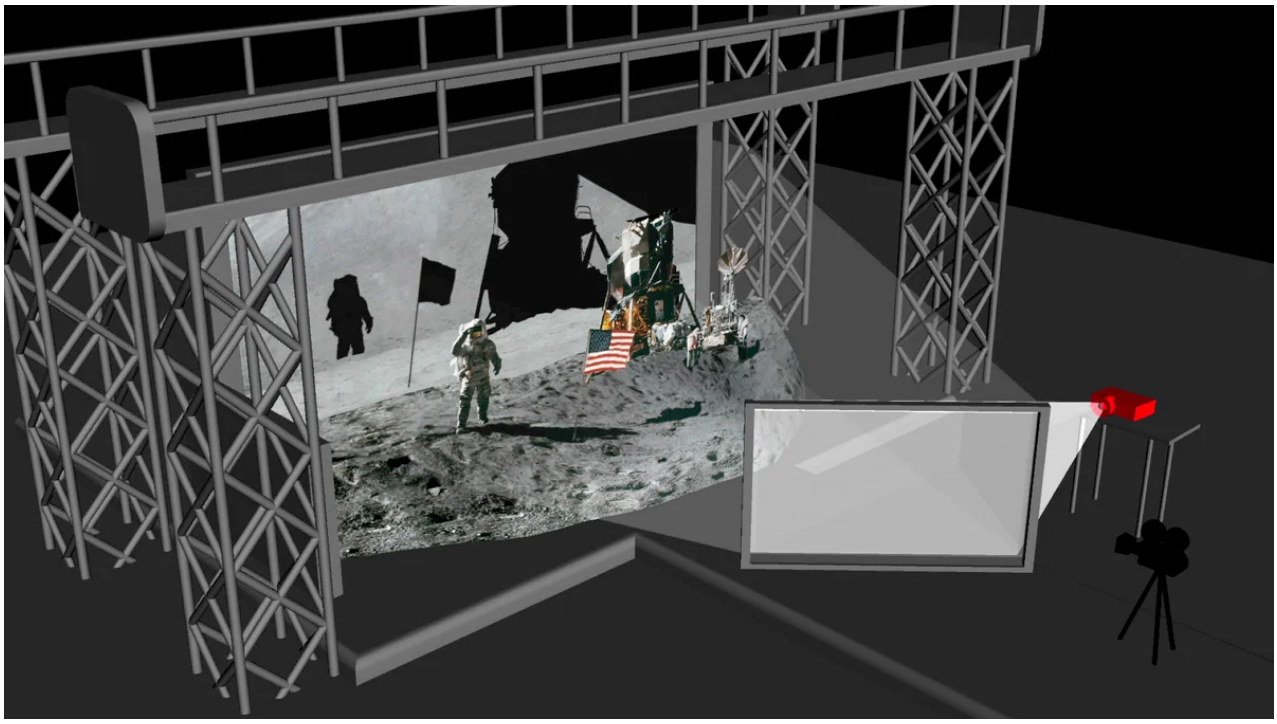
Front projection scheme in the film "2001. A Space Odyssey". Episode "At the Dawn of Humanity".

A scene from the film "2001. A Space Odyssey".

And here's what the pavilion looked like during the filming of this episode. In the background was a reflective screen about 32 meters wide. In the diffused light, he looked gray. Actors who portrayed monkeys were illuminated with a back-side light - the searchlights should not shine on the screen.

Working moment of filming "2001. A Space Odyssey". In the background is a reflective screen. In diffused light, it appears gray. Spotlights shine on the actors with a back-side light.

In such frames, the border separating the vertical backdrop from the horizontal plane of the bulk soil in the pavilion is clearly visible. This border is easy to read in the "lunar" frames.



Front projection scheme for obtaining "lunar" frames. The light from the projector, reflected from the translucent mirror, hits the screen and returns back to the projector. In this case, half of the light reflected from the screen passes through a semitransparent mirror directly into the shooting camera.

With the exact alignment of the camera and the projector, the shadow of the actor is hidden behind his figure.

Imagine what a movie theater screen would look like if it suddenly became 100 times brighter! If it's hard to imagine right away, then mentally imagine that at home or in the office you are showing an image from a video projector on a white screen. Now, instead of a white screen, put a mirror, and direct the light reflected by the mirror into your eye. Can you feel the difference? This is exactly the difference that the scotch-light screen gives. Therefore, the first feature of a reflective screen is incredible brightness, but only for one viewing point.

Another feature of such a screen is that the light scattered in the room does not interfere with the image on the screen, does not light it up. Even if some kind of spotlight shines towards the screen, the filming camera will hardly “notice” this light, because this light will not be reflected towards the camera, but will return back to the spotlight. Of course, in order to get a high-quality image in the background, the main spotlight, imitating the sun, and illuminating the actor, should not be aimed at the screen. If we look closely at the "moon" photographs, then in almost all the pictures, the "sun" shines on the astronauts from behind or from the side, so as not to light up the movie screen.

Since the background is made up of glass beads that act like small mirrors, the brightly lit flag is simply reflected in the mirror screen.
During the filming of the television movie “The Great Space Deception of the USA” on the “Zvezda” TV channel, we encountered just such a phenomenon when we showed how the “lunar” shots were created.

The film "The Big Space Lies of the USA" by "Zvezda" TV Channel

Creation of "lunar" frames. The top picture is the projector is on (the mountain is visible in the background), the bottom picture is off.

Close to the background, the red flag was reflected in the mirror screen and created a faint red halo around it. This halo became especially noticeable when the brightness of the image was increased (photo on the right), and when the image was darkened, the halo merged with the blackness of the background (photo on the left).

When the brightness of the photo is increased, the red halo is more noticeable around the flag - the reflection in the mirror screen.

The fact that with an increase in the brightness of the "lunar" photograph, a bright purple-violet halo appears around the flag (due to the red and blue details of the flag), eloquently indicates that behind the flag there is not a black vacuum of space, but a special reflective screen consisting from glass beads.

The photo is "assembled" from two parts.

How, from a technical point of view, these two images were connected? What equipment was the collage on?

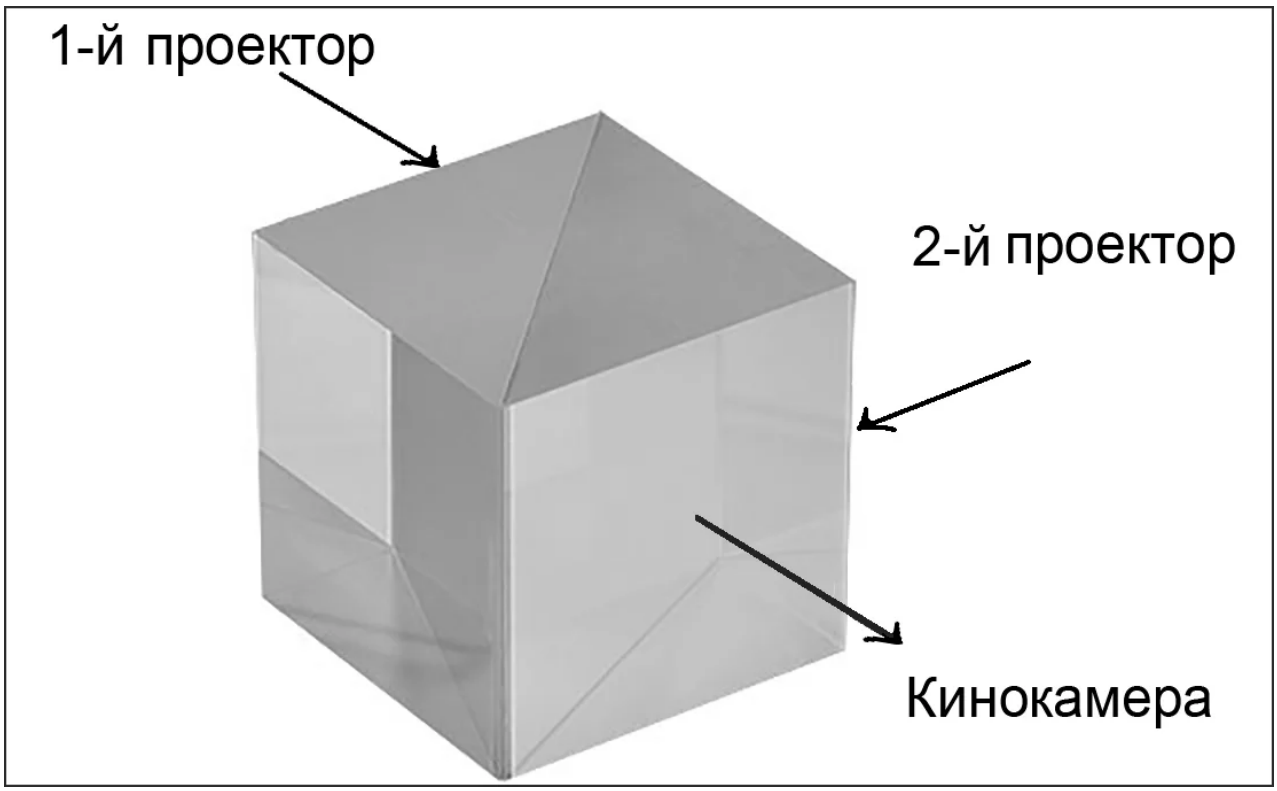
For example, one can assume a kind of "school" version of combining images. Probably, all schoolchildren once made a collage of different postcards: boys glued their faces to the body of a bodybuilder, and girls connected their photos with a Barbie figure.
Is it possible to do the same - take two photographs, cut out the part we need from one photograph with scissors and glue it to another photograph?
Most likely, due to the thickness of the paper, the seam border will be visible. But this is not the main obstacle. After all, further we have to RESET this photograph (make a reproduction) so that it appears in the form of one frame on a transparent film, among other frames, as if it were a picture taken by Hasselblad on the Moon. Such a device, which removes one film image on another film, was widely used in cinema in the pre-digital era, it is called a trick machine. The most advanced equipment for combined filming in those years was the British Oxberry trick machine.

Oxbury trick machine (from the collection of the Polytechnic Museum of Moscow). Left and center - projectors, right - movie camera.

This machine allowed two different images to be stitched together into one frame. To do this, a filming camera was placed on the right side of the car, and in front of it there were two time-lapse projectors.

One projector was on the left, and the lens of that projector was aligned with the lens of the movie camera.

Another projector was installed at 90 °, in the photo of the trick machine it is located in the middle and turned to us with an edge. These two projectors send images to the edge of the beamsplitter cube.



Beamsplitter cube for combining two images (diagram).

To prevent one image from shining through another, one part of the image is separated from another part of the other image using a mask. Among operators of combined surveys, such masks are called "porridge". Looking at films of past years, sometimes even with the naked eye you can notice that masks are used in one or another combined frame.
In the film "The Monster" ("L'animal", France, 1977), the actor Jean Paul Belmondo plays two roles at once, two different characters. Sometimes these two characters appear in the same frame at the same time.

Combined shot. Actor J.P. Belmondo plays two roles at once.

To realize the intended effect, the production of the combined frame on a trick machine was carried out using opaque shutters called masks. A film was charged into one projector, where the actor plays the first character. In this case, the other half of the frame was covered with an opaque mask.

Left side of the frame. The right part of the frame is covered with an opaque mask.

In another projector, a film was loaded, where the actor in the right half of the frame played the second character. In this case, the left part of the frame was covered by another mask, this is a counter mask.

These two images were projected onto two sides of the beamsplitter cube, and the operator immediately saw the final combined image in the camera.

Operator B. Gorbachev in the book "Technique of Combined Shooting" (Moscow, Art, 1961, p. 113) writes: *"The porridge should be set so that its borders coincide with the lines formed by the details of the scenery. It is better to do the porridge that creates on the frame. a complex broken line that guarantees against exposure on the screen, especially in cases where it is difficult to maintain the equality of illumination when shooting the first and second exposures ... "*

To make the border of porridge as less readable as possible, in this case (in the movie" The Monster ") it passes along tree branches and objects in the background in a zigzag line.

The border of the mask is camouflaged by bends.

Now take a closer look and you will see the border of the mask in the movie frame:
Fragment from the movie "The Beast" (France, 1977) When we look at the NASA photo "Harrison Schmidt at the American flag", we find the border of the mask and realize that we are in front of a combined frame, consisting of two halves. If you increase the brightness of the image in Photoshop, the border of the mask will become much clearer.

The fact that there were different backgrounds behind the flag and behind the astronaut suggests that the frame was shot in parts: it was impossible to shoot a frame from such a lower angle in one pass. First, the flag with the image of the Earth and the reflection of the flag in a spherical mirror were filmed, and then the angle for the astronaut was selected separately. If in adjacent takes we see that the actor is holding the flag with one hand, then here the hand that has taken hold of the flag is not visible. Not because she was off the edge of the frame, but simply because these are two frames independent of each other - an astronaut and a flag.
The zigzag line is not the shadow of the astronaut (as some believed), but the border of the mask, along which one image is aligned with the other.

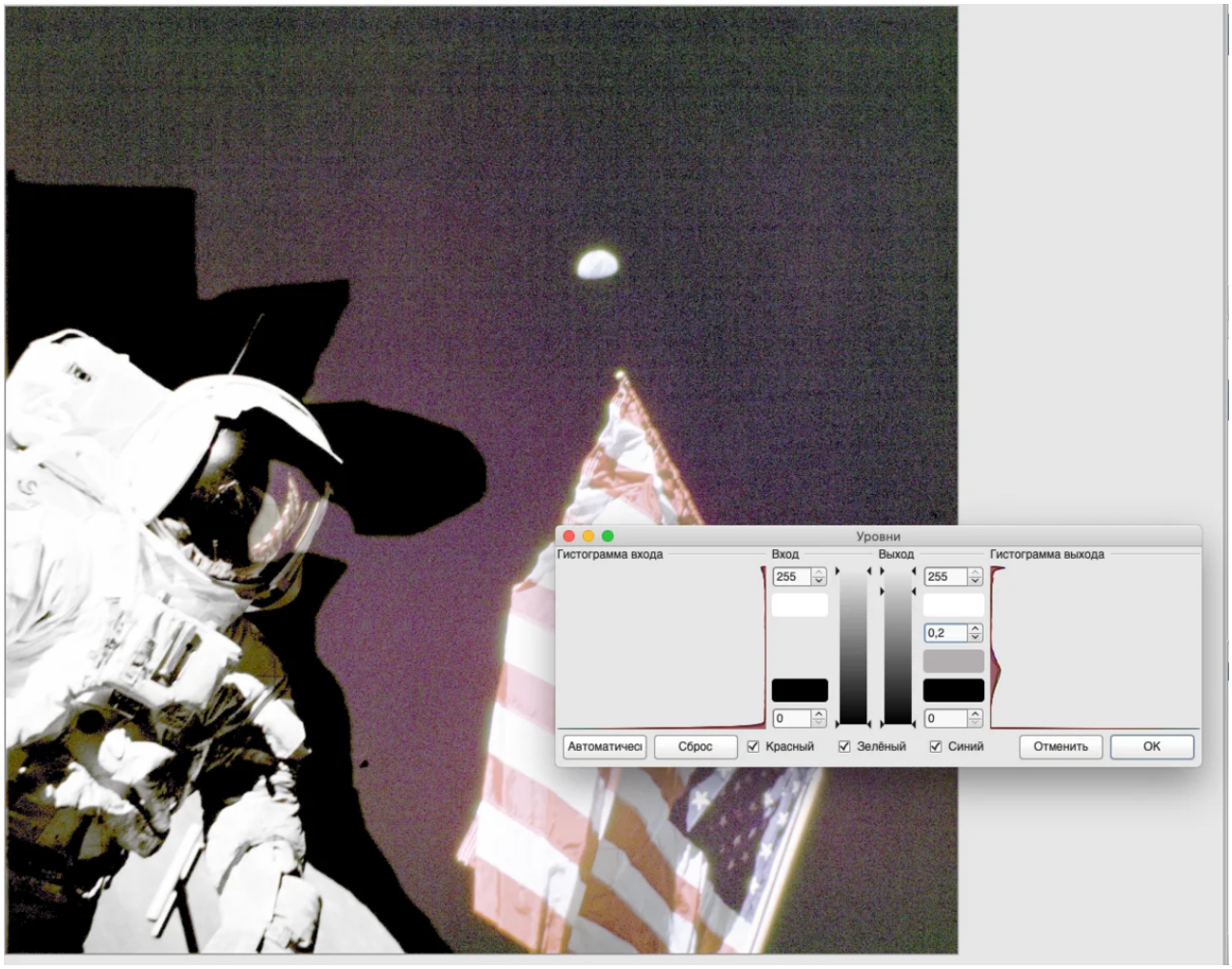
Since attentive "skeptics" constantly reproached NASA for falsifying "lunar" images, and there were more than a hundred such images with obvious claims of falsification, NASA acted in a radical way - after ten years of reproaches, in 2016, it simply deleted this image (where artifacts) from their official website.

The photo was then edited, removed all black "shadows" around the astronaut and posted at a different address. NASA hopes that another ten years will pass, and no one from the younger generation will remember that such a picture, with strange zigzag "shadows" in space, once existed.
Although, this picture still remains on Flicker, but in the shadows it is "sealed" much stronger:Astronaut at the flag (Apollo 17)

There is also a snapshot in Wikipedia commons:https://commons.wikimedia.org/wiki/File:Schmitt_with_Flag_and_Earth_Above_-_GPN-2000-001137.jpg

so download before you delete it! In Photoshop (or another graphics editor), turn the "Level" engine of GRAY - you will see everything for yourself!

I checked it on March 31, 2021, everything works:



Changing the "level" of GRAY.

Output. Analysis of the "lunar" photograph taken from the official NASA website ("Harrison Schmidt on the Moon at the American flag") shows that this image is "assembled" from two photographs, it is a collage. Here you can easily notice the zigzag border separating one image from another. The pictures were taken not on the moon, but in the pavilion. On the right side of the picture, behind the American flag, instead of the "blackness" of space, there is a reflective cinema screen, consisting of small glass balls, reflecting light like a mirror. As the brightness is increased, it becomes clear that this "mirrored" screen reflects the bright red-blue American flag -

and the black "space" behind the flag turns purple-blue. The Moon Mountain in this image is just a flat photograph. And, of course, the Earth above the flag is also a photograph, projected from the same slide projector onto a vertically hanging screen. As for the left side of the photo, where the astronaut is, he was filmed separately, against a background of black velvet, which provided a deep blackness. Therefore, when the brightness increases, the "blackness" of the background on the left side of the photo practically does not change.

*

Cameraman L. Konovalov was with you. Until next time!